

SEQUENCE LISTING

<110> Gu, Wei

<120> NOVEL G-PROTEIN COUPLED RECEPTORS AND USES THEREFOR

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<151> 2000-05-08

<150> 60/132,896

<151> 1999-05-06

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caa gct tta gac ctg agt tgg aat gcc atc cgt gcc atc cac cct gag Gln Ala Leu Asp Leu Ser Trp Asn Ala Ile Arg Ala Ile His Pro Glu	405	410	415	1248
gct ttc tca acc ctt cga tcc ttg gtt aag ctg gac ctg act gac aac Ala Phe Ser Thr Leu Arg Ser Leu Val Lys Leu Asp Leu Thr Asp Asn	420	425	430	1296
cag ctg acc aca ctg ccc ctg gct ggg ctg gga ggc ctg atg cac ctg Gln Leu Thr Thr Leu Pro Leu Ala Gly Leu Gly Gly Leu Met His Leu	435	440	445	1344
aag ctc aaa ggg aac ttg gcc ctg tct cag gcc ttc tcc aag gac agt Lys Leu Lys Gly Asn Leu Ala Leu Ser Gln Ala Phe Ser Lys Asp Ser	450	455	460	1392
ttc cca aaa ctg agg atc ctg gag gtg ccc tac gcc tac cag tgc tgt Phe Pro Lys Leu Arg Ile Leu Glu Val Pro Tyr Ala Tyr Gln Cys Cys	465	470	475	1440
gcc tac ggc atc tgt gcc agc ttc ttc aag acc tct ggg cag tgg cag				1488

Ala Tyr Gly Ile Cys Ala Ser Phe Phe Lys Thr Ser Gly Gln Trp Gln  
485 490 495

gcc gag gac ttt cat cca gaa gaa gag gag gca cca aag agg ccc ctg 1536  
Ala Glu Asp Phe His Pro Glu Glu Glu Glu Ala Pro Lys Arg Pro Leu  
500 505 510

ggt ctc ctt gct gga caa gct gag aac cac tat gac cta gac ctg gat 1584  
Gly Leu Leu Ala Gly Gln Ala Glu Asn His Tyr Asp Leu Asp Leu Asp  
515 520 525

gag ctc cag atg ggg aca gag gac tca aag cca aac ccc agt gtc cag 1632  
Glu Leu Gln Met Gly Thr Glu Asp Ser Lys Pro Asn Pro Ser Val Gln  
530 535 540

tgc agc cct gtt cca ggc ccc ttc aag ccc tgc gag cac ctc ttt gag 1680  
Cys Ser Pro Val Pro Gly Pro Phe Lys Pro Cys Glu His Leu Phe Glu  
545 550 555 560

agc tgg ggc atc cgc ctt gct gtg tgg gcc atc gtg ctg ctc tcc gta 1728  
Ser Trp Gly Ile Arg Leu Ala Val Trp Ala Ile Val Leu Leu Ser Val  
565 570 575

ctc tgt aac ggg ctg gtg ctg ctg aca gtc ttt gcc agc gga ccc agc 1776  
Leu Cys Asn Gly Leu Val Leu Leu Thr Val Phe Ala Ser Gly Pro Ser  
580 585 590

ccg ctg tcc ccc gtc aag ctt gtg gtg ggt gcg atg gca ggc gcc aac 1824  
Pro Leu Ser Pro Val Lys Leu Val Val Gly Ala Met Ala Gly Ala Asn  
595 600 605

gcc ctg acg ggc att tcc tgt ggt ctc ctg gcc tct gtg gac gcc ttg 1872  
Ala Leu Thr Gly Ile Ser Cys Gly Leu Leu Ala Ser Val Asp Ala Leu  
610 615 620

acc tat ggt cag ttc gct gag tat gga gcc cgc tgg gag agc ggt ctg 1920  
Thr Tyr Gly Gln Phe Ala Glu Tyr Gly Ala Arg Trp Glu Ser Gly Leu  
625 630 635 640

ggc tgc cag gct acg ggc ttc ctg gct gtc ctg ggt tca gag gcg tcg 1968  
Gly Cys Gln Ala Thr Gly Phe Leu Ala Val Leu Gly Ser Glu Ala Ser  
645 650 655

gtg ctg ctg ctc aca ctg gcg gcc gtg cag tgc agc atc tct gtg acc 2016  
Val Leu Leu Thr Leu Ala Ala Val Gln Cys Ser Ile Ser Val Thr  
660 665 670

tgc gtc cga gcc tac ggg aag gcg ccg tcg cct ggc agc gtc cgc gca 2064  
Cys Val Arg Ala Tyr Gly Lys Ala Pro Ser Pro Gly Ser Val Arg Ala  
675 680 685

ggc gca ctg gga tgc ctg gcg ctg gcc ggg ctg gcc gca gca ctg ccg 2112  
Gly Ala Leu Gly Cys Leu Ala Leu Ala Gly Leu Ala Ala Ala Leu Pro  
690 695 700

ctg gcc tcg gtg gga gag tat gcc gcc tcc cca ctc tgc ctg ccc tac 2160  
Leu Ala Ser Val Gly Glu Tyr Gly Ala Ser Pro Leu Cys Leu Pro Tyr

705	710	715	720	
gcc cca ccc gag ggc cgg ccg gcc gcc ctg ggc ttc gct gta gcc ctg				2208
Ala Pro Pro Glu Gly Arg Pro Ala Ala Leu Gly Phe Ala Val Ala Leu				
	725	730	735	
gtg atg atg aac tgc ctc tgc ttc ctg gtg gtg gcc ggc gcc tac atc				2256
Val Met Met Asn Ser Leu Cys Phe Leu Val Val Ala Gly Ala Tyr Ile				
	740	745	750	
aag ctc tac tgt gac ctg cca cgg ggt gac ttt gag gcc gtg tgg gac				2304
Lys Leu Tyr Cys Asp Leu Pro Arg Gly Asp Phe Glu Ala Val Trp Asp				
	755	760	765	
tgc gcc atg gtg cgc cac gtg gcc tgg ctc atc ttt gca gat ggc ctc				2352
Cys Ala Met Val Arg His Val Ala Trp Leu Ile Phe Ala Asp Gly Leu				
	770	775	780	
ctc tac tgc ccc gtg gcc ttc ctc agc ttt gcc tcc atg ctg ggc ctc				2400
Leu Tyr Cys Pro Val Ala Phe Leu Ser Phe Ala Ser Met Leu Gly Leu				
	785	790	795	800
ttc cct gtc acc ccc gag gct gtc aag tca gtc ctt ctg gtg gtg ctg				2448
Phe Pro Val Thr Pro Glu Ala Val Lys Ser Val Leu Leu Val Val Leu				
	805	810	815	
cct ctg cct gcc tgc ctc aac cca ctg ctc tac ctg ctc ttc aac cct				2496
Pro Leu Pro Ala Cys Leu Asn Pro Leu Leu Tyr Leu Leu Phe Asn Pro				
	820	825	830	
cac ttc cgg gat gac ctt cgg cgg ctc tgg cca agc cct cgg tcc cca				2544
His Phe Arg Asp Asp Leu Arg Arg Leu Trp Pro Ser Pro Arg Ser Pro				
	835	840	845	
ggg ccc cta gcc tac gct gca gcc ggt gag ctg gag aag agc tcc tgc				2592
Gly Pro Leu Ala Tyr Ala Ala Ala Gly Glu Leu Glu Lys Ser Ser Cys				
	850	855	860	
gac tcc acc caa gcg ctg gtg gct ttc tca gat gtg gat ctt att ctg				2640
Asp Ser Thr Gln Ala Leu Val Ala Phe Ser Asp Val Asp Leu Ile Leu				
	865	870	875	880
gaa gct tct gag gct ggg cag cct cct ggg cta gag acc tat ggc ttc				2688
Glu Ala Ser Glu Ala Gly Gln Pro Pro Gly Leu Glu Thr Tyr Gly Phe				
	885	890	895	
cct tca gtg acc ctc atc tcc cga cat cag ccg ggg gcc acc agg ctg				2736
Pro Ser Val Thr Leu Ile Ser Arg His Gln Pro Gly Ala Thr Arg Leu				
	900	905	910	
gag gga aac cat ttt ata gag tct gat gga acc aag ttt ggg aac cca				2784
Glu Gly Asn His Phe Ile Glu Ser Asp Gly Thr Lys Phe Gly Asn Pro				
	915	920	925	
caa cct ccc atg aag gga gaa ctg ctg ctg aag gca gag gga gcc act				2832
Gln Pro Pro Met Lys Gly Glu Leu Leu Leu Lys Ala Glu Gly Ala Thr				
	930	935	940	

ttg gca ggc tgt ggc tct tcc gtg ggt gga gcc ctc tgg ccc tct ggc 2880  
 Leu Ala Gly Cys Gly Ser Ser Val Gly Gly Ala Leu Trp Pro Ser Gly  
 945 950 955 960

tct ctc ttt gcc tct cac ttg  
 Ser Leu Phe Ala Ser His Leu  
 965

2901

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 <213> Homo sapiens

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 <222> (2)..(1900)

<220>  
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 1 5 10 15

gga att ccc ggg tgg acc cac gcg tcc gtg gag cgg agc cag ggt ctg 97  
 Gly Ile Pro Gly Ser Thr His Ala Ser Val Glu Arg Ser Gln Gly Leu  
 20 25 30

agc ctg ccg gct cat cca gcc tct ctt gct gcc cta gcg gcc tcc aac 145  
 Ser Leu Pro Ala His Pro Ala Ser Leu Ala Ala Leu Ala Ala Ser Asn  
 35 40 45

aca acc gca tct ggg aaa ttg gag ctn gac acc ttc agc cag ctg agc 193  
 Thr Thr Ala Ser Gly Lys Leu Glu Xaa Asp Thr Phe Ser Gln Leu Ser  
 50 55 60

tcc ctg caa gcc ctg gat ctt agc tgg aac gcc atc cgg tcc atc cac 241  
 Ser Leu Gln Ala Leu Asp Leu Ser Trp Asn Ala Ile Arg Ser Ile His  
 65 70 75 80

cct gag gcc ttc tcc acc ctg cac tcc ctg gtc aag ctg gac ctg aca 289  
 Pro Glu Ala Phe Ser Thr Leu His Ser Leu Val Lys Leu Asp Leu Thr  
 85 90 95

gac aac cag ctg acc aca ctg ccc ctg gct gga ctt ggg ggc ttg atg 337  
 Asp Asn Gln Leu Thr Thr Leu Pro Leu Ala Gly Leu Gly Gly Leu Met  
 100 105 110

cat ctg aag ctc aaa ggg aac ctt gct ctc tcc cag gcc ttc tcc aag 385  
 His Leu Lys Leu Lys Gly Asn Leu Ala Leu Ser Gln Ala Phe Ser Lys  
 115 120 125

406050-3634300

gac agt ttc cca aaa ctg agg atc ctg gag gtg cct tat gcc tac cag	433
Asp Ser Phe Pro Lys Leu Arg Ile Leu Glu Val Pro Tyr Ala Tyr Gln	
130 135 140	
tgc tgt ccc tat ggg atg tgt gcc agc ttc ttc aag gcc tct ggg cag	481
Cys Cys Pro Tyr Gly Met Cys Ala Ser Phe Phe Lys Ala Ser Gly Gln	
145 150 155 160	
tgg gag gct gaa gac ctt cac ctt gat gat gag gag tct tca aaa agg	529
Trp Glu Ala Glu Asp Leu His Leu Asp Asp Glu Glu Ser Ser Lys Arg	
165 170 175	
ccc ctg ggc ctc ctt gcc aga caa gca gag aac cac tat gac cag gac	577
Pro Leu Gly Leu Leu Ala Arg Gln Ala Glu Asn His Tyr Asp Gln Asp	
180 185 190	
ctg gat gag ctc cag ctg gag atg gag gac tca aag cca cac ccc agt	625
Leu Asp Glu Leu Gln Leu Glu Met Glu Asp Ser Lys Pro His Pro Ser	
195 200 205	
gtc cag tgt agc cct act cca ggc ccc ttc aag ccc tgt gag tac ctc	673
Val Gln Cys Ser Pro Thr Pro Gly Pro Phe Lys Pro Cys Glu Tyr Leu	
210 215 220	
ttt gaa agc tgg ggc atc cgc ctg gcc gtg tgg gcc atc gtg ttg ctc	721
Phe Glu Ser Trp Gly Ile Arg Leu Ala Val Trp Ala Ile Val Leu Leu	
225 230 235 240	
tcc gtg ctc tgc aat gga ctg gtg ctg ctg acc gtg ttc gct ggc ggg	769
Ser Val Leu Cys Asn Gly Leu Val Leu Leu Thr Val Phe Ala Gly Gly	
245 250 255	
cct gcc ccc ctg ccc ccg gtc aag ttt gtg gta ggt gcg att gca ggc	817
Pro Ala Pro Leu Pro Pro Val Lys Phe Val Val Gly Ala Ile Ala Gly	
260 265 270	
gcc aac acc ttg act ggc att tcc tgt ggc ctt cta gcc tca gtc gat	865
Ala Asn Thr Leu Thr Gly Ile Ser Cys Gly Leu Leu Ala Ser Val Asp	
275 280 285	
gcc ctg acc ttt ggt cag ttc tct gag tac gga gcc cgc tgg gag acg	913
Ala Leu Thr Phe Gly Gln Phe Ser Glu Tyr Gly Ala Arg Trp Glu Thr	
290 295 300	
ggg cta ggc tgc cgg gcc act ggc ttc ctg gca gta ctt ggg tcg gag	961
Gly Leu Gly Cys Arg Ala Thr Gly Phe Leu Ala Val Leu Gly Ser Glu	
305 310 315 320	
gca tcg gtg ctg ctg ctc act ctg gcc gca gtg cag tgc agc gtc tcc	1009
Ala Ser Val Leu Leu Leu Thr Leu Ala Ala Val Gln Cys Ser Val Ser	
325 330 335	
gtc tcc tgt gtc cgg gcc tat ggg aag tcc ccc tcc ctg ggc agc gtt	1057
Val Ser Cys Val Arg Ala Tyr Gly Lys Ser Pro Ser Leu Gly Ser Val	
340 345 350	
cga gca ggg gtc cta ggc tgc ctg gca ctg gca ggg ctg gcc gcc gca	1105

Arg Ala Gly Val Leu Gly Cys Leu Ala Leu Ala Gly Leu Ala Ala Ala  
 355 360 365

ctg ccc ctg gcc tca gtg gga gaa tac ggg gcc tcc cca ctc tgc ctg 1153  
 Leu Pro Leu Ala Ser Val Gly Glu Tyr Gly Ala Ser Pro Leu Cys Leu  
 370 375 380

ccc tac gcg cca cct gag ggt cag cca gca gcc ctg ggc ttc acc gtg 1201  
 Pro Tyr Ala Pro Pro Glu Gly Gln Pro Ala Ala Leu Gly Phe Thr Val  
 385 390 395 400

gcc ctg gtg atg atg aac tcc ttc tgt ttc ctg gtc gtg gcc ggt gcc 1249  
 Ala Leu Val Met Met Asn Ser Phe Cys Phe Leu Val Val Ala Gly Ala  
 405 410 415

tac atc aaa ctg tac tgt gac ctg ccg cgg ggc gac ttt gag gcc gtg 1297  
 Tyr Ile Lys Leu Tyr Cys Asp Leu Pro Arg Gly Asp Phe Glu Ala Val  
 420 425 430

tgg gac tgc gcc atg gtg agg cac gtg gcc tgg ctc atc ttc gca gac 1345  
 Trp Asp Cys Ala Met Val Arg His Val Ala Trp Leu Ile Phe Ala Asp  
 435 440 445

ggg ctc ctc tac tgt ccc gtg gcc ttc ctc agc ttc gcc tcc atg ctg 1393  
 Gly Leu Leu Tyr Cys Pro Val Ala Phe Leu Ser Phe Ala Ser Met Leu  
 450 455 460

ggc ctc ttc cct gtc acg ccc gag gcc gtc aag tct gtc ctg ctg gtg 1441  
 Gly Leu Phe Pro Val Thr Pro Glu Ala Val Lys Ser Val Leu Leu Val  
 465 470 475 480

gtg ctg ccc ctg cct gcc tgc ctc aac cca ctg ctg tac ctg ctc ttc 1489  
 Val Leu Pro Leu Pro Ala Cys Leu Asn Pro Leu Leu Tyr Leu Leu Phe  
 485 490 495

aac ccc cac ttc cgg gat gac ctt cgg cgg ctt cgg ccc cgc gca ggg 1537  
 Asn Pro His Phe Arg Asp Asp Leu Arg Arg Leu Arg Pro Arg Ala Gly  
 500 505 510

gac tca ggg ccc cta gcc tat gct gcg gcc ggg gag ctg gag aag agc 1585  
 Asp Ser Gly Pro Leu Ala Tyr Ala Ala Ala Gly Glu Leu Glu Lys Ser  
 515 520 525

tcc tgt gat tct acc cag gcc ctg gta gcc ttc tct gat gtg gat ctc 1633  
 Ser Cys Asp Ser Thr Gln Ala Leu Val Ala Phe Ser Asp Val Asp Leu  
 530 535 540

att ctg gaa gct tct gaa gct ggg cgg ccc cct ggg ctg gag acc tat 1681  
 Ile Leu Glu Ala Ser Glu Ala Gly Arg Pro Pro Gly Leu Glu Thr Tyr  
 545 550 555 560

ggc ttc ccc tca gtg acc ctc atc tcc tgt cag cag cca ggg gcc ccc 1729  
 Gly Phe Pro Ser Val Thr Leu Ile Ser Cys Gln Gln Pro Gly Ala Pro  
 565 570 575

agg ctg gag ggc agc cat tgt gta gag cca gag ggg aac cac ttt ggg 1777  
 Arg Leu Glu Gly Ser His Cys Val Glu Pro Glu Gly Asn His Phe Gly



580

585

590

580  
aac ccc caa ccc tcc atg gat gga gaa ctg ctg ctg agg gca gag gga 1825  
Asn Pro Gln Pro Ser Met Asp Gly Glu Leu Leu Leu Arg Ala Glu Gly  
595 600 605

595

tct acg cca gca ggt gga ggc ttg tca ggg ggt ggc ggc ttt cag ccc 1873  
Ser Thr Pro Ala Gly Gly Gly Leu Ser Gly Gly Gly Gly Phe Gln Pro

610 615 620

610  
tct ggc ttg gcc ttt gct tca cac gtg taaatatccc tccccattct 1920  
Ser Gly Leu Ala Phe Ala Ser His Val  
625 630

625  
tctcttcccc tctcttcctt ttctctcttc cccctcggtg aatgatggct gcttctaaaa 1980  
caaatacaac caaaactcag cagtgtgata tatagcagga tggcccagta cctggctcca 2040  
ctgatcacct ctctctgtg accatcacca acgggtgcct cttggcctgg ctttcccttg 2100  
gccttctca gcttcacctt gatactgggc ctcttccttg tcatgtctga agctgtggac 2160  
cagagacctg gacttttgtc tgcttaaggg aaatgaggga agtaaagaca gtgaaggggt 2220  
ggaggggtga tcagggcaca gtggacaggg agacctaca gagaaaggcc tggaagggtga 2280  
tttcccggtg gactcatgga taggatacaa aatgtgttcc atgtaccatt aatcttgaca 2340  
tatgccatgc ataaagactt cctattaaaa taagctttgg aagagattaa aaaaaaaaaa 2400  
aaagggcggc cgctctagag gatccaagct tacgtacgcg tgcatgcgac gtcatagctc 2460  
ttctatagtg tcacctaaat tcaatt 2486

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<212> PRT
<213> Homo sapiens
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20 25 30

Ser Leu Pro Ala His Pro Ala Ser Leu Ala Ala Leu Ala Ala Ser Asn  
35 40 45

Thr Thr Ala Ser Gly Lys Leu Glu Xaa Asp Thr Phe Ser Gln Leu Ser  
50 55 60

Ser Leu Gln Ala Leu Asp Leu Ser Trp Asn Ala Ile Arg Ser Ile His  
 65 70 75 80  
 Pro Glu Ala Phe Ser Thr Leu His Ser Leu Val Lys Leu Asp Leu Thr  
 85 90 95  
 Asp Asn Gln Leu Thr Thr Leu Pro Leu Ala Gly Leu Gly Gly Leu Met  
 100 105 110  
 His Leu Lys Leu Lys Gly Asn Leu Ala Leu Ser Gln Ala Phe Ser Lys  
 115 120 125  
 Asp Ser Phe Pro Lys Leu Arg Ile Leu Glu Val Pro Tyr Ala Tyr Gln  
 130 135 140  
 Cys Cys Pro Tyr Gly Met Cys Ala Ser Phe Phe Lys Ala Ser Gly Gln  
 145 150 155 160  
 Trp Glu Ala Glu Asp Leu His Leu Asp Asp Glu Glu Ser Ser Lys Arg  
 165 170 175  
 Pro Leu Gly Leu Leu Ala Arg Gln Ala Glu Asn His Tyr Asp Gln Asp  
 180 185 190  
 Leu Asp Glu Leu Gln Leu Glu Met Glu Asp Ser Lys Pro His Pro Ser  
 195 200 205  
 Val Gln Cys Ser Pro Thr Pro Gly Pro Phe Lys Pro Cys Glu Tyr Leu  
 210 215 220  
 Phe Glu Ser Trp Gly Ile Arg Leu Ala Val Trp Ala Ile Val Leu Leu  
 225 230 235 240  
 Ser Val Leu Cys Asn Gly Leu Val Leu Leu Thr Val Phe Ala Gly Gly  
 245 250 255  
 Pro Ala Pro Leu Pro Pro Val Lys Phe Val Val Gly Ala Ile Ala Gly  
 260 265 270  
 Ala Asn Thr Leu Thr Gly Ile Ser Cys Gly Leu Leu Ala Ser Val Asp  
 275 280 285  
 Ala Leu Thr Phe Gly Gln Phe Ser Glu Tyr Gly Ala Arg Trp Glu Thr  
 290 295 300  
 Gly Leu Gly Cys Arg Ala Thr Gly Phe Leu Ala Val Leu Gly Ser Glu  
 305 310 315 320  
 Ala Ser Val Leu Leu Leu Thr Leu Ala Ala Val Gln Cys Ser Val Ser  
 325 330 335  
 Val Ser Cys Val Arg Ala Tyr Gly Lys Ser Pro Ser Leu Gly Ser Val  
 340 345 350  
 Arg Ala Gly Val Leu Gly Cys Leu Ala Leu Ala Gly Leu Ala Ala Ala  
 355 360 365

Leu Pro Leu Ala Ser Val Gly Glu Tyr Gly Ala Ser Pro Leu Cys Leu  
 370 375 380  
 Pro Tyr Ala Pro Pro Glu Gly Gln Pro Ala Ala Leu Gly Phe Thr Val  
 385 390 395 400  
 Ala Leu Val Met Met Asn Ser Phe Cys Phe Leu Val Val Ala Gly Ala  
 405 410 415  
 Tyr Ile Lys Leu Tyr Cys Asp Leu Pro Arg Gly Asp Phe Glu Ala Val  
 420 425 430  
 Trp Asp Cys Ala Met Val Arg His Val Ala Trp Leu Ile Phe Ala Asp  
 435 440 445  
 Gly Leu Leu Tyr Cys Pro Val Ala Phe Leu Ser Phe Ala Ser Met Leu  
 450 455 460  
 Gly Leu Phe Pro Val Thr Pro Glu Ala Val Lys Ser Val Leu Leu Val  
 465 470 475 480  
 Val Leu Pro Leu Pro Ala Cys Leu Asn Pro Leu Leu Tyr Leu Leu Phe  
 485 490 495  
 Asn Pro His Phe Arg Asp Asp Leu Arg Arg Leu Arg Pro Arg Ala Gly  
 500 505 510  
 Asp Ser Gly Pro Leu Ala Tyr Ala Ala Ala Gly Glu Leu Glu Lys Ser  
 515 520 525  
 Ser Cys Asp Ser Thr Gln Ala Leu Val Ala Phe Ser Asp Val Asp Leu  
 530 535 540  
 Ile Leu Glu Ala Ser Glu Ala Gly Arg Pro Pro Gly Leu Glu Thr Tyr  
 545 550 555 560  
 Gly Phe Pro Ser Val Thr Leu Ile Ser Cys Gln Gln Pro Gly Ala Pro  
 565 570 575  
 Arg Leu Glu Gly Ser His Cys Val Glu Pro Glu Gly Asn His Phe Gly  
 580 585 590  
 Asn Pro Gln Pro Ser Met Asp Gly Glu Leu Leu Leu Arg Ala Glu Gly  
 595 600 605  
 Ser Thr Pro Ala Gly Gly Gly Leu Ser Gly Gly Gly Gly Phe Gln Pro  
 610 615 620  
 Ser Gly Leu Ala Phe Ala Ser His Val  
 625 630

&lt;210&gt; 6

&lt;211&gt; 1899

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

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<223> n = any nucleotide
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[illegible]

190

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405 410 415

[illegible]

tac atc aaa ctg tac tgt gac ctg ccg cgg ggc gac ttt gag gcc gtg 1296  
 Tyr Ile Lys Leu Tyr Cys Asp Leu Pro Arg Gly Asp Phe Glu Ala Val  
 420 430

tgg gac tgc gcc atg gtg agg cac gtg gcc tgg ctc atc ttc gca gac 1344  
 Trp Asp Cys Ala Met Val Arg His Val Ala Trp Leu Ile Phe Ala Asp  
 435 440 445

ggg ctc ctc tac tgt ccc gtg gcc ttc ctc agc ttc gcc tcc atg ctg 1392  
 Gly Leu Leu Tyr Cys Pro Val Ala Phe Leu Ser Phe Ala Ser Met Leu  
 450 455 460

ggc ctc ttc cct gtc acg ccc gag gcc gtc aag tct gtc ctg ctg gtg 1440  
 Gly Leu Phe Pro Val Thr Pro Glu Ala Val Lys Ser Val Leu Leu Val  
 465 470 475 480

gtg ctg ccc ctg cct gcc tgc ctc aac cca ctg ctg tac ctg ctc ttc 1488  
 Val Leu Pro Leu Pro Ala Cys Leu Asn Pro Leu Leu Tyr Leu Leu Phe  
 485 490 495

aac ccc cac ttc cgg gat gac ctt cgg cgg ctt cgg ccc cgc gca ggg 1536  
 Asn Pro His Phe Arg Asp Asp Leu Arg Arg Leu Arg Pro Arg Ala Gly  
 500 505 510

gac tca ggg ccc cta gcc tat gct gcg gcc ggg gag ctg gag aag agc 1584  
 Asp Ser Gly Pro Leu Ala Tyr Ala Ala Ala Gly Glu Leu Glu Lys Ser  
 515 520 525

tcc tgt gat tct acc cag gcc ctg gta gcc ttc tct gat gtg gat ctc 1632  
 Ser Cys Asp Ser Thr Gln Ala Leu Val Ala Phe Ser Asp Val Asp Leu  
 530 535 540

att ctg gaa gct tct gaa gct ggg cgg ccc cct ggg ctg gag acc tat 1680  
 Ile Leu Glu Ala Ser Glu Ala Gly Arg Pro Pro Gly Leu Glu Thr Tyr  
 545 550 555 560

ggc ttc ccc tca gtg acc ctc atc tcc tgt cag cag cca ggg gcc ccc 1728  
 Gly Phe Pro Ser Val Thr Leu Ile Ser Cys Gln Gln Pro Gly Ala Pro  
 565 570 575

agg ctg gag ggc agc cat tgt gta gag cca gag ggg aac cac ttt ggg 1776  
 Arg Leu Glu Gly Ser His Cys Val Glu Pro Glu Gly Asn His Phe Gly  
 580 585 590

aac ccc caa ccc tcc atg gat gga gaa ctg ctg ctg agg gca gag gga 1824  
 Asn Pro Gln Pro Ser Met Asp Gly Glu Leu Leu Leu Arg Ala Glu Gly  
 595 600 605

tct acg cca gca ggt gga ggc ttg tca ggg ggt ggc ggc ttt cag ccc 1872  
 Ser Thr Pro Ala Gly Gly Gly Leu Ser Gly Gly Gly Gly Phe Gln Pro  
 610 615 620

tct ggc ttg gcc ttt gct tca cac gtg 1899  
 Ser Gly Leu Ala Phe Ala Ser His Val  
 625 630

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 <212> DNA  
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 <222> (1) .. (2208)

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 1 5 10  
 gag ttc cct gtg gcc atc cgg acc ctg ggc aga ctg cag gaa ctg ggg 96  
 Glu Phe Pro Val Ala Ile Arg Thr Leu Gly Arg Leu Gln Glu Leu Gly 30  
 20 25  
 ttc cat aac aac aac atc aag gcc atc cca gaa aag gcc ttc atg ggg 144  
 Phe His Asn Asn Asn Ile Lys Ala Ile Pro Glu Lys Ala Phe Met Gly 45  
 35 40  
 aac cct ctg cta cag acg ata cac ttt tat gat aac cca atc cag ttt 192  
 Asn Pro Leu Leu Gln Thr Ile His Phe Tyr Asp Asn Pro Ile Gln Phe 60  
 50 55  
 gtg gga aga tcg gca ttc cag tac ctg cct aaa ctc cac aca cta tct 240  
 Val Gly Arg Ser Ala Phe Gln Tyr Leu Pro Lys Leu His Thr Leu Ser 80  
 65 70 75  
 ctg aat ggt gcc atg gac atc cag gag ttt cca gat ctc aaa ggc acc 288  
 Leu Asn Gly Ala Met Asp Ile Gln Glu Phe Pro Asp Leu Lys Gly Thr 95  
 85 90  
 acc agc ctg gag atc ctg acc ctg acc cgc gca ggc atc cgg ctg ctc 336  
 Thr Ser Leu Glu Ile Leu Thr Leu Thr Arg Ala Gly Ile Arg Leu Leu 110  
 100 105  
 cca tcg ggg atg tgc caa cag ctg ccc agg ctc cga gtc ctg gaa ctg 384  
 Pro Ser Gly Met Cys Gln Gln Leu Pro Arg Leu Arg Val Leu Glu Leu 125  
 115 120  
 tct cac aat caa att gag gag ctg ccc agc ctg cac agg tgt cag aaa 432  
 Ser His Asn Gln Ile Glu Glu Leu Pro Ser Leu His Arg Cys Gln Lys 140  
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 Leu Glu Glu Ile Gly Leu Gln His Asn Arg Ile Trp Glu Ile Gly Ala 160  
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 Asp Thr Phe Ser Gln Leu Ser Ser Leu Gln Ala Leu Asp Leu Ser Trp 175  
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 Asn Ala Ile Arg Ser Ile His Pro Glu Ala Phe Ser Thr Leu His Ser

180	185	190	
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195	200	205	
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Ala Gly Leu Gly Gly Leu Met His Leu Lys Leu Lys Gly Asn Leu Ala			
210	215	220	
ctc tcc cag gcc ttc tcc aag gac agt ttc cca aaa ctg agg atc ctg			720
Leu Ser Gln Ala Phe Ser Lys Asp Ser Phe Pro Lys Leu Arg Ile Leu			
225	230	235	240
gag gtg cct tat gcc tac cag tgc tgt ccc tat ggg atg tgt gcc agc			768
Glu Val Pro Tyr Ala Tyr Gln Cys Cys Pro Tyr Gly Met Cys Ala Ser			
245	250	255	
ttc ttc aag gcc tct ggg cag tgg gag gct gaa gac ctt cac ctt gat			816
Phe Phe Lys Ala Ser Gly Gln Trp Glu Ala Glu Asp Leu His Leu Asp			
260	265	270	
gat gag gag tct tca aaa agg ccc ctg ggc ctc ctt gcc aga caa gca			864
Asp Glu Glu Ser Ser Lys Arg Pro Leu Gly Leu Leu Ala Arg Gln Ala			
275	280	285	
gag aac cac tat gac cag gac ctg gat gag ctc cag ctg gag atg gag			912
Glu Asn His Tyr Asp Gln Asp Leu Asp Glu Leu Gln Leu Glu Met Glu			
290	295	300	
gac tca aag cca cac ccc agt gtc cag tgt agc cct act cca ggc ccc			960
Asp Ser Lys Pro His Pro Ser Val Gln Cys Ser Pro Thr Pro Gly Pro			
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ttc aag ccc tgt gag tac ctc ttt gaa agc tgg ggc atc cgc ctg gcc			1008
Phe Lys Pro Cys Glu Tyr Leu Phe Glu Ser Trp Gly Ile Arg Leu Ala			
325	330	335	
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Val Trp Ala Ile Val Leu Leu Ser Val Leu Cys Asn Gly Leu Val Leu			
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ctg acc gtg ttc gct ggc ggg cct gcc ccc ctg ccc ccg gtc aag ttt			1104
Leu Thr Val Phe Ala Gly Gly Pro Ala Pro Leu Pro Pro Val Lys Phe			
355	360	365	
gtg gta ggt gcg att gca ggc gcc aac acc ttg act ggc att tcc tgt			1152
Val Val Gly Ala Ile Ala Gly Ala Asn Thr Leu Thr Gly Ile Ser Cys			
370	375	380	
ggc ctt cta gcc tca gtc gat gcc ctg acc ttt ggt cag ttc tct gag			1200
Gly Leu Leu Ala Ser Val Asp Ala Leu Thr Phe Gly Gln Phe Ser Glu			
385	390	395	400
tac gga gcc cgc tgg gag acg ggg cta ggc tgc cgg gcc act ggc ttc			1248
Tyr Gly Ala Arg Trp Glu Thr Gly Leu Gly Cys Arg Ala Thr Gly Phe			
405	410	415	



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Leu Ala Val Leu Gly Ser Glu Ala Ser Val Leu Leu Leu Thr Leu Ala	
420 425 430	
gca gtg cag tgc agc gtc tcc gtc tcc tgt gtc cgg gcc tat ggg aag	1344
Ala Val Gln Cys Ser Val Ser Val Ser Cys Val Arg Ala Tyr Gly Lys	
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tcc ccc tcc ctg ggc agc gtt cga gca ggg gtc cta ggc tgc ctg gca	1392
Ser Pro Ser Leu Gly Ser Val Arg Ala Gly Val Leu Gly Cys Leu Ala	
450 455 460	
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Leu Ala Gly Leu Ala Ala Ala Leu Pro Leu Ala Ser Val Gly Glu Tyr	
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Gly Ala Ser Pro Leu Cys Leu Pro Tyr Ala Pro Pro Glu Gly Gln Pro	
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Ala Ala Leu Gly Phe Thr Val Ala Leu Val Met Met Asn Ser Phe Cys	
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Phe Leu Val Val Ala Gly Ala Tyr Ile Lys Leu Tyr Cys Asp Leu Pro	
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cgg ggc gac ttt gag gcc gtg tgg gac tgc gcc atg gtg agg cac gtg	1632
Arg Gly Asp Phe Glu Ala Val Trp Asp Cys Ala Met Val Arg His Val	
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gcc tgg ctc atc ttc gca gac ggg ctc ctc tac tgt ccc gtg gcc ttc	1680
Ala Trp Leu Ile Phe Ala Asp Gly Leu Leu Tyr Cys Pro Val Ala Phe	
545 550 555 560	
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Leu Ser Phe Ala Ser Met Leu Gly Leu Phe Pro Val Thr Pro Glu Ala	
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Val Lys Ser Val Leu Leu Val Val Leu Pro Leu Pro Ala Cys Leu Asn	
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Pro Leu Leu Tyr Leu Leu Phe Asn Pro His Phe Arg Asp Asp Leu Arg	
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Arg Leu Arg Pro Arg Ala Gly Asp Ser Gly Pro Leu Ala Tyr Ala Ala	
610 615 620	
gcc ggg gag ctg gag aag agc tcc tgt gat tct acc cag gcc ctg gta	1920
Ala Gly Glu Leu Glu Lys Ser Ser Cys Asp Ser Thr Gln Ala Leu Val	
625 630 635 640	

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645 650 655

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Pro Pro Gly Leu Glu Thr Tyr Gly Phe Pro Ser Val Thr Leu Ile Ser  
660 665 670

tgt cag cag cca ggg gcc ccc agg ctg gag ggc agc cat tgt gta gag 2064  
Cys Gln Gln Pro Gly Ala Pro Arg Leu Glu Gly Ser His Cys Val Glu  
675 680 685

cca gag ggg aac cac ttt ggg aac ccc caa ccc tcc atg gat gga gaa 2112  
Pro Glu Gly Asn His Phe Gly Asn Pro Gln Pro Ser Met Asp Gly Glu  
690 695 700

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705 710 715 720

ggg ggt ggc ggc ttt cag ccc tct ggc ttg gcc ttt gct tca cac gtg 2208  
Gly Gly Gly Gly Phe Gln Pro Ser Gly Leu Ala Phe Ala Ser His Val  
725 730 735

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aagagattaa aaaaaaaaaa aaa 2711

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20 25 30

Phe His Asn Asn Asn Ile Lys Ala Ile Pro Glu Lys Ala Phe Met Gly  
35 40 45

Asn Pro Leu Leu Gln Thr Ile His Phe Tyr Asp Asn Pro Ile Gln Phe  
 50 55 60  
 Val Gly Arg Ser Ala Phe Gln Tyr Leu Pro Lys Leu His Thr Leu Ser  
 65 70 75 80  
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 85 90 95  
 Thr Ser Leu Glu Ile Leu Thr Leu Thr Arg Ala Gly Ile Arg Leu Leu  
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 Ser His Asn Gln Ile Glu Glu Leu Pro Ser Leu His Arg Cys Gln Lys  
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 165 170 175  
 Asn Ala Ile Arg Ser Ile His Pro Glu Ala Phe Ser Thr Leu His Ser  
 180 185 190  
 Leu Val Lys Leu Asp Leu Thr Asp Asn Gln Leu Thr Thr Leu Pro Leu  
 195 200 205  
 Ala Gly Leu Gly Gly Leu Met His Leu Lys Leu Lys Gly Asn Leu Ala  
 210 215 220  
 Leu Ser Gln Ala Phe Ser Lys Asp Ser Phe Pro Lys Leu Arg Ile Leu  
 225 230 235 240  
 Glu Val Pro Tyr Ala Tyr Gln Cys Cys Pro Tyr Gly Met Cys Ala Ser  
 245 250 255  
 Phe Phe Lys Ala Ser Gly Gln Trp Glu Ala Glu Asp Leu His Leu Asp  
 260 265 270  
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 275 280 285  
 Glu Asn His Tyr Asp Gln Asp Leu Asp Glu Leu Gln Leu Glu Met Glu  
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 Asp Ser Lys Pro His Pro Ser Val Gln Cys Ser Pro Thr Pro Gly Pro  
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 Phe Lys Pro Cys Glu Tyr Leu Phe Glu Ser Trp Gly Ile Arg Leu Ala  
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 Val Trp Ala Ile Val Leu Leu Ser Val Leu Cys Asn Gly Leu Val Leu  
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Leu Thr Val Phe Ala Gly Gly Pro Ala Pro Leu Pro Pro Val Lys Phe  
355 360 365

Val Val Gly Ala Ile Ala Gly Ala Asn Thr Leu Thr Gly Ile Ser Cys  
370 375 380

Gly Leu Leu Ala Ser Val Asp Ala Leu Thr Phe Gly Gln Phe Ser Glu  
385 390 395 400

Tyr Gly Ala Arg Trp Glu Thr Gly Leu Gly Cys Arg Ala Thr Gly Phe  
405 410 415

Leu Ala Val Leu Gly Ser Glu Ala Ser Val Leu Leu Leu Thr Leu Ala  
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Ala Val Gln Cys Ser Val Ser Val Ser Cys Val Arg Ala Tyr Gly Lys  
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Ser Pro Ser Leu Gly Ser Val Arg Ala Gly Val Leu Gly Cys Leu Ala  
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Gly Ala Ser Pro Leu Cys Leu Pro Tyr Ala Pro Pro Glu Gly Gln Pro  
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Val Lys Ser Val Leu Leu Val Val Leu Pro Leu Pro Ala Cys Leu Asn  
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Pro Leu Leu Tyr Leu Leu Phe Asn Pro His Phe Arg Asp Asp Leu Arg  
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Asp Thr Phe Ser Gln Leu Ser Ser Leu Gln Ala Leu Asp Leu Ser Trp			
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Asn Ala Ile Arg Ser Ile His Pro Glu Ala Phe Ser Thr Leu His Ser			
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Leu Val Lys Leu Asp Leu Thr Asp Asn Gln Leu Thr Thr Leu Pro Leu			
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Ala Gly Leu Gly Gly Leu Met His Leu Lys Leu Lys Gly Asn Leu Ala			
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Phe Phe Lys Ala Ser Gly Gln Trp Glu Ala Glu Asp Leu His Leu Asp			
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Asp Glu Glu Ser Ser Lys Arg Pro Leu Gly Leu Leu Ala Arg Gln Ala			
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Glu Asn His Tyr Asp Gln Asp Leu Asp Glu Leu Gln Leu Glu Met Glu			
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Asp Ser Lys Pro His Pro Ser Val Gln Cys Ser Pro Thr Pro Gly Pro			
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ttc aag ccc tgt gag tac ctc ttt gaa agc tgg ggc atc cgc ctg gcc			1008
Phe Lys Pro Cys Glu Tyr Leu Phe Glu Ser Trp Gly Ile Arg Leu Ala			
325	330	335	
gtg tgg gcc atc gtg ttg ctc tcc gtg ctc tgc aat gga ctg gtg ctg			1056
Val Trp Ala Ile Val Leu Leu Ser Val Leu Cys Asn Gly Leu Val Leu			
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Leu Thr Val Phe Ala Gly Gly Pro Ala Pro Leu Pro Pro Val Lys Phe	
355 360 365	
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Val Val Gly Ala Ile Ala Gly Ala Asn Thr Leu Thr Gly Ile Ser Cys	
370 375 380	
ggc ctt cta gcc tca gtc gat gcc ctg acc ttt ggt cag ttc tct gag	1200
Gly Leu Leu Ala Ser Val Asp Ala Leu Thr Phe Gly Gln Phe Ser Glu	
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Tyr Gly Ala Arg Trp Glu Thr Gly Leu Gly Cys Arg Ala Thr Gly Phe	
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Gly Ala Ser Pro Leu Cys Leu Pro Tyr Ala Pro Pro Glu Gly Gln Pro	
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Ala Trp Leu Ile Phe Ala Asp Gly Leu Leu Tyr Cys Pro Val Ala Phe	
545 550 555 560	
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565 570 575	

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 Val Lys Ser Val Leu Leu Val Val Leu Pro Leu Pro Ala Cys Leu Asn  
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 Pro Leu Leu Tyr Leu Leu Phe Asn Pro His Phe Arg Asp Asp Leu Arg  
 595 600 605

cgg ctt cgg ccc cgc gca ggg gac tca ggg ccc cta gcc tat gct gcg 1872  
 Arg Leu Arg Pro Arg Ala Gly Asp Ser Gly Pro Leu Ala Tyr Ala Ala  
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gcc ggg gag ctg gag aag agc tcc tgt gat tct acc cag gcc ctg gta 1920  
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 Pro Pro Gly Leu Glu Thr Tyr Gly Phe Pro Ser Val Thr Leu Ile Ser  
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 675 680 685

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 Met Pro Ser Pro  
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ccg ggg ctc cgg gcg cta tgg ctt tgc gcc gcg ctg tgc gct tcc cgg 163



Pro Gly Leu Arg Ala Leu Trp Leu Cys Ala Ala Leu Cys Ala Ser Arg 20  
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agg gcc ggc ggc gcc ccc cag ccc ggc ccg ggg ccc acc gcc tgc ccg 211  
 Arg Ala Gly Gly Ala Pro Gln Pro Gly Pro Gly Pro Thr Ala Cys Pro 35  
 25 30

gcc ccc tgc cac tgc cag gag gac ggc atc atg ctg tct gcc gac tgc 259  
 Ala Pro Cys His Cys Gln Glu Asp Gly Ile Met Leu Ser Ala Asp Cys 50  
 40 45

tct gag ctc ggg ctg tcc gcc gtt ccg ggg gac ctg gac ccc ctg acg 307  
 Ser Glu Leu Gly Leu Ser Ala Val Pro Gly Asp Leu Asp Pro Leu Thr 65  
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gct tac ctg gac ctc agc atg aac aac ctc aca gag ctt cag cct ggc 355  
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 70 75

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cat ctc tca cac atc cca gga caa gca ttc tct ggt ctc tac agc ctg 451  
 His Leu Ser His Ile Pro Gly Gln Ala Phe Ser Gly Leu Tyr Ser Leu 115  
 105 110

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cgc cac ctc tgg ctg gac gac aat gca ctc acg gag atc cct gtc agg 643  
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235

240

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Lys Leu Gln Glu Phe Pro Val Ala Ile Arg Thr Leu Gly Arg Leu Gln	
245 250 255 260	
gaa ctg ggg ttc cat aac aac aac atc aag gcc atc cca gaa aag gcc	931
Glu Leu Gly Phe His Asn Asn Asn Ile Lys Ala Ile Pro Glu Lys Ala	
265 270 275	
ttc atg ggg aac cct ctg cta cag acg ata cac ttt tat gat aac cca	979
Phe Met Gly Asn Pro Leu Leu Gln Thr Ile His Phe Tyr Asp Asn Pro	
280 285 290	
atc cag ttt gtg gga aga tcg gca ttc cag tac ctg cct aaa ctc cac	1027
Ile Gln Phe Val Gly Arg Ser Ala Phe Gln Tyr Leu Pro Lys Leu His	
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310 315 320	
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Lys Gly Thr Thr Ser Leu Glu Ile Leu Thr Leu Thr Arg Ala Gly Ile	
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